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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/059,421	01/31/2002	Tetsuo Shibuya	YOR920010126US2	6845
21254	7590	08/04/2004	EXAMINER	
MCGINN & GIBB, PLLC 8321 OLD COURTHOUSE ROAD SUITE 200 VIENNA, VA 22182-3817			LY, CHEYNE D	
			ART UNIT	PAPER NUMBER
			1631	

DATE MAILED: 08/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/059,421

**Applicant(s)**

SHIBUYA ET AL.

**Examiner**

Cheyne D Ly

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

1. Applicants' arguments filed May 11, 2004 have been fully considered but they are not deemed to be persuasive. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.
2. The addition of new claims 24-29 has been acknowledged.
3. Claims 1-29 are examined on the merits.

### **CLAIM REJECTIONS - 35 U.S.C. § 112, SECOND PARAGRAPH**

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-15 and 24-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
6. This rejection is necessitated by Applicants amendments.
7. Specific to claim 1, lines 4-5, the recitation of "discovers a pattern from said pattern database in said DNA sequence to identify a putative gene in said DNA sequence" causes said claim to be vague and indefinite as discussed below. Line 2 recites a pattern database of amino acids. However, lines 4-5 recite the discovery of a pattern from the amino acid pattern database in a DNA sequence. Claim 1 is unclear as whether the discovery of a pattern resulted from the DNA sequence being directly compared to a pattern database of amino acids, or the DNA sequence processed, then, the pattern from the comparison of the

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processed of the DNA to the pattern database of amino acids. The same issued is present in claim 29, lines 3-5. Clarification of the metes and bounds is required. Claims 2-15 and 24-28 are rejected for being dependent from claim 1.

**CLAIM REJECTIONS - 35 U.S.C. § 112, FIRST PARAGRAPH**

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claim 24 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. NEW MATTER.

10. This rejection is necessitated by Applicants amendments.

11. Specific to claim 24, line 1, the limitation of "said processor iteratively examines" has not been found in the instant specification. It is noted that the instant specification discloses "repeating the gene discovery process" (page 20, line 18). However, said disclosure above is different from the limitation of "said processor iteratively examines."

**CLAIM REJECTIONS - 35 USC § 101**

12. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

13. Claims 1-14, 16-24, and 26-29 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory algorithm type subject matter.

14. This rejection is maintained with respect to claims 1-14 and 16-23, as recited in the previous office action mailed February 11, 2004. The instant rejection has been extended to new claims 24 and 26-29.

15. This rejection is necessitated by Applicants amendments.

#### **RESPONSE TO ARGUMENTS**

16. Applicant argues that “the Examiner’s allegation that these claims are not patentable is utter nonsense.” Further, Applicant argues that the claimed invention of “the processor may access the pattern database, and may locate a pattern from the pattern database in the DNA sequence (which was input by the input device) to identify a putative gene” is patentable subject matter. Applicant’s arguments have been fully considered and found to be unpersuasive as discussed below. It is noted that the claimed invention is directed to a system comprising a processor and database wherein said processor discovers a pattern from said database. However, the processes for discovering patterns performed by said processor do not cause any physical alteration outside of the claimed system, as a result of the processes. A system which processes data and does not cause any physical alteration outside of the claimed system, as a result of the processes performed on said data, is considered to be non-statutory subject matter. “For example, a computer process that simply calculates a mathematical algorithm that models noise is nonstatutory. However, a claimed process for digitally filtering noise employing the mathematical algorithm is statutory.” (MPEP § 2106 (IV)(B)(2) (b), part ii). Similar to the nonstatutory example above, the instant invention comprises electronic means for discovering patterns within a system without any physical alteration outside of said system resulted from said discovery.

17. It is acknowledged that the instant invention comprises an input device, however, said “input device” could reasonable be construed as a device for the electronic exchange of input files to another device in the claimed system. The electronic communication (exchange) without causing any physical alteration, outside the claimed system, resulted from the communication does not cause the claimed invention to be statutory subject matter.

18. It is noted that claims 15 and 25 have been omitted from the instant rejection due to the recitation of the limitation of “a display device for displaying an output from said processor” which causes a physical transformation outside of the claimed system.

#### **CLAIM REJECTIONS - 35 USC § 102**

19. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

20. Claims 1-29 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Rigoutsos et al. (1998).

21. This rejection is maintained with respect to claim 1-23, as recited in the previous office action mailed February 11, 2004. The instant rejection has been extended to new claims 24-

29. This rejection is necessitated by Applicants amendments.

#### **RESPONSE TO ARGUMENT**

22. Applicant argues that Rigoutsos et al. does not disclose the limitation of “a processor which discovers a pattern from said pattern database in said DNA sequence to identify a putative gene in said DNA sequence” as recited in instant claims 1, 16 and 23. Applicant’s

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argument has been fully considered and found to be unpersuasive as discussed below. It is noted that Applicant discloses the “inventive system may report an ORF as a putative gene when one or more pattern matches are identified in the amino acid translation” in the instant specification (page 5, lines 4-11). Consistent with the above disclosure of “a putative gene.” Rigoutsos et al. discloses leghemoglobins are plant hemoglobins that show sequence similarity to other members of the large globin superfamily. The system of Rigoutsos et al. is used to identify heme-binding pocket signature (putative gene) wherein sequences of leghemoglobins derived from such pattern database as PROSITE (page 61, columns 1-2, Leghemoglobins §). The inclusion of a reference by Bairoch et al., which has been necessitated by claim amendments is not being used a prior art, but only to expand on the pattern database of PROSITE. PROSITE is a databases of proteins translated form cDNA (ORF) wherein biologically significant patterns and profiles have been established for known protein families (Bairoch et al., Abstract etc.). The above citation of Bairoch et al. further anticipates the amended limitation of claims 1, 16, and 23.

**REJECTION RE-ITERATED**

23. Rigoutsos et al. discloses a system and method for pattern discovery (matches) in biological sequences using the TEIRESIAS algorithm (Abstract etc.). The system and method of Rigoutsos et al. comprises an input device operated in an IBM Power-PC workstation (programmable storage medium) (page 60, column 1, lines 1-3) and DNA and protein databases such as SwissProt, EMBL, GenBank, and PIR (page 62, column 1, line 22 to column 2, line 4), as in instant claims 1, 28, and 29.

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24. Rigoutsos et al. discloses SwissProt (parent database) comprising PROSITE entries (page 61, column 2, last ¶), as in instant claims 5 and 6, and claim 25, lines 1-4.

25. The inclusion of GenBank (Benson et al.) is not being used as prior art but only to expand on the inherent characteristics of GenBank as cited by Rigoutsos et al. GenBank, a nucleic acid database, comprises annotation features such as translated CDS (ORF) (page 3, Figure 2). GenBank is available via the World Wide Web through the NCBI's home page (display) or server/client versions, as in instant claims 2-4, 7-9, 14-18, 21-23, and claim 25, lines 5-6.

26. Rigoutsos et al. a pattern-discovery algorithm which uses the SwissProt database comprising amino acid sequences translated from nucleic acid sequences for determining matches by generating a scoring matrix from the pattern of amino acid position of the patterns wherein threshold values are assigned a weight of one for match and nothing for the others. The patterns with the highest scoring sequences (exceeds predetermined threshold) determine the sequence of the specific sequence (pages 57, column 1, The algorithm §, to page 59, column 1, and page 60, column 2, Verifying Observations §), as in instant claims 10-13, 19, 20, 26, and 27.

27. Rigoutsos et al. discloses TEIRESIAS operates in two phases: scanning and convolution, wherein scanning identifies elementary patterns, and convolution combines elementary patterns into progressively larger and larger patterns until all the existing, maximal patterns have been generated (iterative) (page 56, column 1, last ¶), as in instant claim 24.



### CONCLUSION

28. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

29. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

30. Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet.

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The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

31. For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

32. Any inquiry concerning this communication or earlier communications from the examiner should be directed to C. Dune Ly, whose telephone number is (571) 272-0716. The examiner can normally be reached on Monday-Friday from 8 A.M. to 4 P.M.

33. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward, Ph.D., can be reached on (571) 272-0722.

C. Dune Ly

7/26/04

*Ardin H. Marschel* 8/2/04  
ARDIN H. MARSCHEL  
PRIMARY EXAMINER